Name:	***Building Construction for Fire Protection***
Course Description:	This course provides the components of building construction that relate to fire and life safety. The focus of this course is on firefighter safety. The elements of construction and design of structures are shown to be key factors when inspecting buildings, preplanning fire operations, and operating at emergencies.
Prerequisite:	Completion of *Principles of Emergency Services* or instructor approval.
Outcomes:	1. Demonstrate an understanding of building construction as it relates to firefighter safety, buildings codes, fire prevention, code inspection and firefighting strategy and tactics. 2. Classify major types of building construction. 3. Analyze the hazards and tactical considerations associated with the various types of building construction. 4. Explain the different loads and stresses that are placed on a building and their interrelationships. 5. Identify the principle structural components of buildings and demonstrate an understanding of the functions of each. 6. Differentiate between fire resistance and flame spread, and describe the testing procedures used to establish ratings for each. 7. Classify occupancy designations of the building code. 8. Identify the indicators of potential structural failure as they relate to firefighter safety. 9. Identify and analyze the causes involved in the line of duty firefighter deaths related to structural and wildland firefighting, training and research and the reduction of emergency risks and accidents.
Available Student Texts:	*Building Construction for the Fire Service;* Francis Brannigan, NFPA, 1992 *Building Construction for the Fire Service*, Fire Protection Publications *Collapse of Burning Buildings;* Vincent Dunn, Pennwell, 1988

Supporting References/Research for Faculty and Students:	**U.S. Fire Administration** *Building Construction, Combustible & Non-Combustible,* U. S. Fire Administration Publications: http://www.usfa.fema.gov/applications/publications See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous Materials, Health and Safety, Wildfire Applied Research: http://www.usfa.fema.gov Research Reports: http://www.usfa.fema.gov Technical Reports: http://www.usfa.fema.gov/applications/publications Lessons Learned Information Sharing: http://www.llis.dhs.gov/member/secure/index.cfm Topical Fire Research Series: http://www.usfa.fema.gov/research Learning Resource Center: http://www.lrc.fema.gov **National Institute for Standards and Technology** http://www.fire.nist.gov: See Publications, FIREDOC (under Publications) Lessons Learned Information Sharing: http://www.llis.dhs.gov/member/secure/index.cfm http://www.usfa.fema.gov/applications/publications/techreps.cfm **References** *Strategic and Tactical Considerations on the Fire Ground (and Instructor's Guide);* James Smith, Brady-Prentice Hall *Strategic and Tactical Considerations on the Fire Ground Study Guide*; James Smith, Trafford Press Society of Fire Protection Engineers: http://www.pentoncmg.com/sfpe/index.html **Current Events/News** http://www.firehouse.com http://www.fireengineering.com http://www.withthecommand.com
Assessment:	Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.
Points of Contact:	Terry Koeper, Crafton Hills College, California (909) 389-3261, tkoeper@craftonhills.edu Ralph DeLaOssa, Long Beach City College, Long Beach, California (562) 938-4338, rdelaossa@lbcc.edu **Revision 11/05**

Course Outline

Building Construction for Fire Protection

I. Introduction
- A. History of Building Construction
- B. Governmental Functions, Building and Fire Codes
- C. Fire Risks and Fire Protection
- D. Fire Loss Management and Life Safety
- E. Pre-fire Planning and Fire Suppression Strategies

II. Principles of Construction
- A. Terminology and Definitions
- B. Building and Occupancy Classifications
- C. Characteristics of Building Materials
- D. Types and Characteristics of Fire Loads
- E. Effects of Energy Conservation

III. Building Construction
- A. Structural Members
  1. Definitions, Descriptions and Carrying Capacities
  2. Effects of Loads
- B. Structural Design and Construction Methods
- C. System Failures

IV. Principles of Fire Resistance
- A. Standards of Construction
- B. Fire Intensity and Duration
- C. Theory vs. Reality

V. Fire Behavior vs. Building Construction
- A. Flame Spread
- B. Smoke and Fire Containment
  1. Construction and Suppression Systems
  2. HVAC Systems
  3. Rack Storage

Combustible

VI. Wood Construction
- A. Definition and Elements of Construction
- B. Types of Construction
- C. Fire Stopping and Fire Retardants
- D. Modifications/Code Compliance

VII. Ordinary Construction
- A. Definitions and Elements of Construction
- B. Structural Stability and Fire Barriers
- C. Modifications/Code Compliance

VIII. Collapse

VIII. Ventilation

Non-Combustible

IX. Steel Construction
- A. Definitions and Elements of Construction
- B. Structural Stability, Fire Resistance and Fire Protection of Elements
- C. Modifications/Code Compliance

X. Concrete Construction
- A. Definitions and Elements of Construction
- B. Structural Stability and Fire Resistance
- C. Modifications/Code Compliance

XI. High Rise Construction
- A. Early vs. Modern Construction
- B. Vertical and Horizontal Extension of Fire and Smoke
- C. Fire Protection and Suppression
- D. Elevators
- E. Atriums/Lobbies
- F. Modifications/Code Compliance

XII. Collapse

XIV. Ventilation